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10/670,036	09/23/2003	Michael D. Flasza	00580-0190US	5048

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EXAMINER	
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ART UNIT	PAPER NUMBER
2816	

DATE MAILED: 09/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/670,036	FLASZA, MICHAEL D.	
	Examiner	Art Unit	
	Terry L. Englund	2816	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 March 2006 and 16 June 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 June 2006* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

The Response submitted on Jun 16, 2006 was carefully reviewed and considered with the following results:

The drawing objections described in the previous Office Action have been maintained, and are described later under the appropriate section. Related comments are described later under the Response to Arguments/Comments section.

The amended paragraph on page 2 overcame its objection, which has now been withdrawn. However, the applicant's arguments/comments did not overcome the other objections to the disclosure that were described on pages 3-6 of the previous Office Action. Therefore, those objections have been maintained, and are described later under the appropriate section. Related comments are described under the Response to Arguments/Comments section.

For similar reasons, the rejections of claims 1-20 under 35 U.S.C. 112, first paragraph have been maintained. Those rejections are described later under the appropriate section, and related comments are also described under the Response to Arguments/Comments section.

Drawings

The drawings remain objected to under 37 CFR 1.83(a) because they fail to clearly show how control 38 controls anything, and how resistor R can actually sense the loop current as described in the specification. For example, the node coupled in common to resistor R, control 38, capacitors C1-C3, diode D1, and control circuit 26 in the applicant's own Fig. 1 is shown coupled directly to ground. With such a ground connection, how is the loop current sensed? With current source I1 providing a constant current (e.g. see pages 9 (lines 8-9) and 10 (lines 11-

12), where and how is this loop current actually varied? For example, does control 38 change the voltage drop between terminal 18 and ground changed, or somehow divert current away from, or allow more current to flow to, current source 40 to maintain constant current I1? Therefore, any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

The disclosure remains objected to because of the following informalities: Page 3 (line 20) and page 4 (line 19) both indicate the current within a loop is controlled. However, the applicants' own figures and disclosure never clearly shows or discloses how this is actually

accomplished. Therefore, it is suggested the wording, and/or figures, be changed to more accurately depict what is actually meant to be shown and disclosed, and/or comments by the applicant clarify the operation of the circuit better by actually addressing the specific concerns described by the examiner. Page 4, line 11 is misleading since it appears to imply the cascaded charge pump circuits would not be connected to the control circuit if the regulator diode was not there. Using the applicants' Fig. 1 for reference, diode D1 does have one terminal (i.e. its cathode) connected between cascaded charge pump circuits U1,U2 and control circuit 26. However, cascaded charge pump circuits U1,U2 and control circuit 26 would still be connected together, even if diode D1 was not present. Therefore, it is suggested more accurate phrasing be used on page 4 (e.g. --a regulator diode is connected to the cascaded charge pump circuits and the control circuit--). The phrase "Further features and advantages of the invention will be readily apparent from the specification and from the drawings" on page 5, lines 7-8 are also misleading. If everything was clearly shown and disclosed, this examiner, and the various other examiners that have been consulted about this application, would not be confused with respect to how the circuit operates, and how it is shown within the applicant's Fig. 1. For example, it is still not known how control 38 controls the loop current, or how resistor R can actually sense current flowing within the loop since resistor R is clearly shown with one terminal coupled directly to ground, and the other terminal is coupled directly to the negative terminal of a remote power source. It is not understood how "instrument 12 varies the signal current in the loop between 4mA and 20mA DC" as cited on page 6, lines 2-3. For example, where in the loop is the current actually varied? Since current I1 of the applicants' Fig. 1 is constant (e.g. see "3.5mA current source 40" on page 9, lines 8-9; and "current input I1 to the system is constant at

3.5mA" on page 10, lines 11-12), and resistor R is coupled directly to ground, in what specific section of the applicants' circuit will the loop current actually vary in? If the applicants' do not intend to limit the invention "to any particular type of instrument or measurement technique" as cited on page 6, lines 7-8, then what do the applicants' intend to mean by using "loop powered process control instrument power supply" in the title, and "loop powered process instrument" within the claims? For example, what do the applicants' mean by the use of "loop", "process", and "instrument" since none of these terms have been clearly defined within the disclosure, and they can all be interpreted in various ways? It is not clear how "output circuit 38 controls current on the loop 10 in accordance with the control signal on the line 36" as cited on page 6, lines 14-15. Again using the applicants' Fig. 1 as a reference, control 38 is shown coupled between the positive terminal of power source 20 and ground, while also being coupled to the left terminal of resistor R, and receiving control signal 36. However, the circuit does not appear to show any output from control 38. After consulting with a number of other examiners, it was determined that current source 40 may possibly be some type of pass transistor, and control 38 might provide some type of control signal to a control terminal of the pass transistor, thus maintaining/ regulating constant current I1 (e.g. at 3.5mA) through current source 40. However, it is also possible that control 38 might somehow control internal clock 56 (e.g. see Fig. 2) within each charge pump circuit U1 and U2; allow some of the 3.5mA current to be diverted to ground via capacitors C1-C3; or perhaps divert current away from current source 40 to ground (e.g. the total current flowing from power supply 20 includes current flowing to control circuit 38 and to current source 40, wherein those currents are complementary, and since current I1 is constant, it would be current through control circuit 38 that would be controlled to increase or decrease with

respect to any change in the feedback signal on line 36). Therefore, it appears that numerous ways can effectively vary the loop current. However, the applicant's own disclosure and figures do not make the control readily apparent. When considering the applicant's own " 4-20mA Current Loop Primer" reference submitted previously, it appears the loop current within that reference is controlled by a comparator with its positive and negative power supply terminals coupled in series within the loop. However, how does that type of structure relate to the present invention which apparently has the negative power supply terminal of control 38 connected directly to ground? Therefore, until the applicant clearly shows or clarifies how control 38 works, what it actually controls, and if the right terminal of resistor R is actually meant to be connected directly to ground, it will remain unknown to this examiner how the loop current within the applicants' own Fig. 1 can be sensed and varied. Viewed in a slightly different manner, and using the applicant's own Fig. 1 as a reference, it is understood that control circuit 26 is coupled between voltage V3 and ground, provides control signal 36, and has some type of connection to primary element 14. However, it is not understood what this control circuit can be, and how control signal 36 and the connection to 14 relate to one another. For example, a simple two resistor voltage divider coupled between voltage V3 and ground can provide a control signal from between the two resistors, wherein the connection to 14 could possibly be directly connected to either V3, control signal 36, or the common connection between the two resistors within the voltage divider, with that connection effectively representing a process type variable (e.g. voltage or current). Also, it is believed control 38 could be a comparator coupled between 16 and ground for power, receiving the potential at node 18 as a reference signal, and receiving control signal 36 as the variable/comparison signal. However, as cited previously, it is not

understood how control 38 actually controls the current through the loop, or even what (e.g. elements) it controls. For example, does control 38 have an output that controls current source 40, and/or somehow controls the switching within U1 and U2; does control 38 control the overall voltage drop between node 16 and ground, or allow current to be either diverter away from, or added to, current source 40 to maintain constant current I1? As presently shown and described, it is understood control 38 can be considered as being coupled in parallel with respect to power supply 20 and sense resistor R, wherein current source 40, charge pump circuits U1 and U2, and control circuit 26 are also coupled in parallel with 20 and R. Therefore, from the figure, and lack of specific details within the description, it is not understood where the loop current would actually be sensed or varied, and clarification is still requested with respect to how control circuit 26 "of any known design" (see page 7, lines 4-6) and control block 38 (see page 7, lines 12-14), can actually perform their function. Page 7, line 11 "senses" should be --sense-- to improve word flow. To be more consistent with labeling throughout the disclosure, it is suggested "instrument electronics" on lines 14 and 15 of page 10 be changed to "control circuit" (e.g. see lines 9 and 10 of the same page). Appropriate corrections and/or clarifications are still required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Even after consulting with other examiners, and re-reading the disclosure again, claims 1-20 remain rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not considered as being enabling. How the loop current is actually sensed and controlled is

considered by this examiner to be critical or essential to the practice and understanding of the invention. Therefore, these current related limitations included in the claim(s) are neither enabled by the disclosure, nor by the circuit shown within Fig. 1. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976). Although control block 38, shown in Fig. 1, allegedly controls the loop current, and resistor R senses the loop current, the description and the circuit shown in Fig. 1 do not indicate how that is actually performed, or even provide clear support for that operation. As described above with respect to the disclosure and Fig. 1, control 38 does not appear to actually affect the loop's current since control 38 is simply shown connected between node 16 and ground, and in parallel with 20/R as well in parallel with 40/U1/U2/26. Therefore, this type of configuration does not provide sufficient information to how the loop current will actually be controlled, or even how the loop current can actually be sensed by resistor R. For example, does control 38 control current source 40, one or both of the charge pump circuits U1 and U1, some combination of these elements, or possibly the voltage drop between node 16 and ground?

No claim is allowable.

Response to Arguments/Comments

The applicant's arguments filed May 26, 2006 have been fully considered but they are not persuasive. The applicant argues that: 1) the invention is not about how loop current is controlled, but to a power supply circuit that controls loop current; 2) available loop current powers the device that controls current loop; 3) instrument 12/output circuit 28 varies/controls current on the loop; 4) control block 38 is in series with sense resistor R and power source 20; 5) sense resistor R senses loop current flowing through resistor R; 6) since the disclosed methods

and techniques are well known, greater details are not required; the specification and drawings are sufficient; the disclosure is enabling; and the figures are accurate; 7) submitted references "4-20mA Current Loop Primer" and "4-20 mA Transmitters" show known loop current related circuits; and 8) there is no reason to doubt the truth of the statements disclosed, and the Examiner hasn't set forth why they should be doubted.

Related to most of the arguments described above, the applicant is basically correct if the applicant's own Fig. 1 is actually completely accurate with respect to what is conventional and known to those skilled in the art. Under those circumstances, the conventional and known do not need to be described in detail. However, this examiner strongly traverses the applicant's implication that the rejections described in the previous Office Action should be withdrawn. This examiner continuously requests clarification about the applicant's own Fig. 1. For example, how does the common connection to ground and elements R, 38, C1-C3,D1,26 relate to the loop current/current control? For example, even after consulting numerous other examiners (i.e. at least six examiners scattered across four different classes), none of us could determine how the applicant's invention, as shown in Fig. 1, could work. Therefore, due to the apparent common connection of ground to sense resistor R, control 38, the lower plates of capacitors C1-C3, the anode of diode D1, and control circuit 26, the applicant is again requested to clearly clarify what comprises the loop, and how its current can be controlled within the circuit shown in Fig. 1. As presently shown and understood, there are three current paths effectively coupled between the positive power supply terminal 16 and ground. These three current paths are also coupled in parallel with respect to one another, wherein one path comprises series coupled power source 20 and resistor R; another path comprises control 38; and the third path comprises all the other

elements shown in Fig. 1. Related to this, a clear description of how resistor R can actually sense the loop current is also requested. As presently shown within Fig. 1, resistor R will sense only the series current flowing from terminal 16 to ground through the series connected power source 20 and resistor R. The common ground connection makes determining what is actually considered a loop very difficult, if not impossible. Without knowing what is actually considered the loop, the actual invention may merely be referring to controlling current within at least one of the current paths coupled between the positive power source terminal 16 and ground. Also, at least one good description, and/or example (or reference) on how control 38 will actually control that (loop) current, is requested with respect to the circuit presently shown within Fig. 1.

The following comments address the applicant's arguments and comments more specifically:

1) The applicant admits that the invention is not about how loop current is controlled, but to a power supply circuit that controls loop current. However, using the applicant's Fig. 1 as a reference, if 30 is considered the power supply circuit, and it receives constant current I1 from current source 40 within output circuit 28, it is not clear how power supply circuit 30 actually controls constant current I1. For example, doesn't output circuit 28 actually control loop current?

2-3) Related to the above comments, since available loop current powers the device that controls current loop, and instrument 12/output circuit 28 apparently varies/controls current on the loop, where is this control actually taking place? For example, is the voltage drop across sense resistor R varied to control the total current flowing between positive power supply terminal 16 and ground through series connected power supply 20 and sense resistor R, and thus the total voltage drop between terminal 16 and ground, or does control 38 somehow divert extra

current away from, or allow more current to flow to, current source 40 so current I1 can be maintained constant?

4) The applicant considers control block 38 as being coupled in series with sense resistor R and power source 20. However, this series connection must be clarified. Although power supply 20 and sense resistor R (shown in Fig. 1) are coupled in series between terminal 16 and ground, it appears the basic connection of elements 38, 4 and 20 has series connected power supply 20 and sense resistor R coupled in parallel with control 38, with respect to terminal 16 and ground. Therefore, what is the series connection of elements 38, R, and 20?

5) Sense resistor R apparently senses loop current flowing through resistor R. However, isn't that actually the series current flowing through power supply 20 and sense resistor R between terminal 16 and ground, or is the total current flowing through 20 and R considered equivalent to the loop current, which apparently equals the sum of the current flowing through 38 and all the other elements shown within Fig. 1?

6) The applicant insists the disclosed methods and techniques are well known, greater details are not required; the specification and drawings are sufficient; the disclosure is enabling; and the figures are accurate. However, if that is the case, it is not understood why, after re-reading/reviewing the disclosure/Fig. 1 again, and consulting with other examiners, none of us have been able to readily determine how the invention will actually function.

7) The "4-20mA Current Loop Primer" and "4-20 mA transmitters" submitted by the applicant were reviewed and considered, but they seem to raise more questions with respect to what is shown and disclosed within the present application. The "4-20mA Current Loop Primer" was helpful with understanding some basic concepts related to current loops, but the reference

clearly shows closed, series loop circuits in both Figs 1 and 3 without any connection to ground. Therefore, it is not understood how such circuits would actually relate to the applicant's Fig. 1 that clearly shows a common connection to ground. Page 2 of the "4-20 mA Transmitters" reference cites "Signal loops, power supplies, and grounds should always be completely isolated from each other" and "The transmitter floats and signal ground is in the receiver." Since the applicant's power supply 20 is shown connected directly to control 38 and current source 40 at terminal 16; and control 38, capacitors C1-C3, diode D1, and control circuit 26 are all shown connected directly to ground, how are these elements isolated from one another? Related to this understanding of the invention, which elements within the applicant's Fig. 1 would be considered the actual transmitter of the invention (e.g. placing it in perspective with the transmitter shown in the "4-20 mA Transmitter" reference)?

8) Although the applicant states there is no reason to doubt the truth of the statements disclosed, and the Examiner hasn't set forth why they should be doubted, the numerous comments described in the previous Office Action, as well as the present Office Action, raise enough questions about what is actually shown and disclosed. It is suggested actual operations be described with respect to the common ground connection shown in the present application's Fig. 1, and clarification be made with respect to what is actually considered the loop, and where the loop current actually flows. General statements do not help clarify the specific areas of concerns described by the examiner.

Therefore, from the consultations this examiner has had with other examiners, and until the applicant can both verify that the circuit shown in Fig. 1 is entirely accurate with its connections to ground, and can clearly describe or explain how the Fig. 1 circuit can actually

sense and control the loop current, it is believed the rejections described within the present Office Action, and in the previous Office Action, are proper with respect to what is actually shown and disclosed.

No prior art rejections have been made in the present Office Action. However, once a better understanding of the claimed invention's limitations are known, with a respect to the grounded circuit presently shown within the applicant's own Fig. 1, it is possible prior art rejections can be made in the future.

Any inquiry concerning this communication, or previous communications, from the examiner should be directed to Terry L. Englund whose telephone number is (571) 272-1743. The examiner can normally be reached Monday-Friday from 7 AM to 3 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tim Callahan, can be reached on (571) 272-1740.

The new central official fax number is (571) 273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (571) 272-1562.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TLE
Terry L. Englund
16 September 2006

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